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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/720,094	11/25/2003	Yasunori Bito	Q78644	4905

7590 12/02/2005  
SUGHRUE, MION, ZINN, MACPEAK & SEAS  
2100 Pennsylvania Avenue, N.W.  
Washington, DC 20037

EXAMINER

DICKEY, THOMAS L

ART UNIT	PAPER NUMBER
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2826

DATE MAILED: 12/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/720,094

Applicant(s)

BITO, YASUNORI

Examiner

Thomas L. Dickey

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 2 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

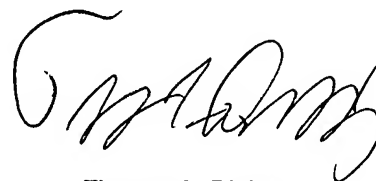
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 20 May 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-13 and 15-35 is/are pending in the application.
- 4a) Of the above claim(s) 19-35 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-8, 10-13 and 15-18 is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.



Thomas L. Dickey  
Patent Examiner  
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## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 November 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

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## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/17/05 has been entered.

### ***Drawings***

2. The drawings are objected to because the electrodes marked "14S" and "14S" in figures 11-18 are referred to as "14S" and "14D" in the specification. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement-drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement

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sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the examiner does not accept the changes, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

3. Claims 1, 16 and 18 are objected to because of the following informalities:

A. Claim 1 recites the limitation "said AlGaAs layer" in line 15. There is insufficient antecedent basis for this limitation in the claim. It appears applicant intended to recite:

– a GaAs layer formed on an AlGaAs layer –

in lines 14 and 15 of claim 1, as amended.

B. It appears that the "AlGaAs layer" referred to on lines 3 of claims 16 and 18 refers back to the element introduced as "said [sic] AlGaAs" in line 15 of claim 1. For this reason it is improper to attempt to re-introduce this element as "an [undoped] AlGaAs layer" in line 3 of claim 16, and as "an AlGaAs layer [of said first conductivity type]" in line 3 of claim 18.

C. It further appears that the "GaAs layer" referred to in lines 4 of claims 16 and 18 refers back to the element previously introduced as "an [sic] GaAs layer" in line 14 of claim 1. For this reason it is improper to attempt to re-introduce this element as "an

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[undoped] GaAs layer” in lines 4 of claims 16 and 18. Claims 16 and 18 should make clear that it is merely the dopant type of the previously introduced “AlGaAs layer” and “GaAs layer” that is being limited.

Appropriate correction is required.

***Allowable Subject Matter***

4. Claims 1-8, 10-13 and 15-18 are allowed over the references of record because none of these references disclosed or can be combined to yield the claimed invention such as a heterojunction field effect type semiconductor device, comprising a GaAs substrate; a channel layer formed over said GaAs substrate; a first semiconductor layer including no aluminum formed over said channel layer; a cap layer of a first conductivity type formed on said first semiconductor layer, said cap layer creating a first recess on said first semiconductor layer; first and second ohmic electrodes formed on said cap layer, respectively; a second semiconductor layer of second conductivity type formed on said first semiconductor layer within said first recess, said second semiconductor layer being isolated from said cap layer; a gate electrode formed on said second semiconductor layer; and a third semiconductor layer interposed between said first semiconductor layer and said cap layer and having a second recess, said second semiconductor layer passing through the second recess of said third semiconductor layer to reach said first semiconductor layer, said third semiconductor layer comprising a GaAs layer formed on an AlGaAs layer, as recited in claim 1.

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As was noted in the Paper mailed 6/16/05, Kato et al. discloses a heterojunction field effect type semiconductor device with all the limitations of claim 1 except Kato et al.'s two part GaAs/AlGaAs third semiconductor layer has a first AlGaAs part 511 formed on a second GaAs part 510. Claim 1 requires the second GaAs part of the third layer to be formed on the first AlGaAs part.

### ***Conclusion***

5. This application is in condition for allowance except for the following formal matters:

Drawing objections as per section 2 above.

Claim informalities as per section 3 above.

Prosecution on the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

A shortened statutory period for reply to this action is set to expire **TWO MONTHS** from the mailing date of this letter.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas L Dickey whose telephone number is 571-272-1913. The examiner can normally be reached on Monday-Thursday 8-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan J Flynn can be reached on 571-272-1915. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).